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THESIS PROPOSAL

Title: Effect of Corrosion on Carbon Steel, Stainless Steel, Low Alloy and Duplex Substrate coated with nanocoating on CO2 Enviroment

EXECUTIVE SUMMARY

CO2 corrosion can be prevent by coating technology. Introducing of nanocoating will reduce corrosion risk as it reduce maintenance and repair cost and protection environment security.

1. THE TOPIC / PROBLEM

Rich CO2 environment with the presence of water will produce corrosive environment to steel. It will corrode steel inform of pitting. To control corrosion, nanocoating will introduce in further experiment. It interesting to know how effective nanocoating will offer to reduce CO2 corrosion.

2. LITERATURE REVIEW: PREVIOUS WORK ON THE TOPIC

Corrosion is defined as destruction process of materials by influence of high or very low temperature, high corrosive fluid, microbiology activities and high mechanical movement. The emerging of nanocoating technology give big impact to modern industry as well as oil and gas industry. Previous study shows high pitting corrosion occur on bare surface stainless steel on rich CO2 environment. Corrosion occurs when CO2 immersed in water to form Carbonic Acid. In this study, nanocoating has been used to protect steel from Carbonic acid. Nanocoating will act as corrosion protection by introducing thin layer chemical barrier on substrate surface. Nanocoating will increase economic life of steel which it increase metal reliability. As consequence, it will reduce cost for operation maintenance and repair.

3. THEORETICAL CONCERN / SITUATING THE STUDY IN THE FIELD

Theoritically, introducing of nanocoating on steel will reduce CO2 corrosion and other form of corrosion such as atmospheric corrosion, oxygen corrosion and corrosion under insulation. In oil and gas industry, cathodic protection is used as additional method to control external corrosion. Compatibility coating with designed cathodic system is very important to optimize corrosion control. It need further study to very on this problem.

4. RESEARCH QUESTIONS AND THE WORKING HYPOTHESIS

How effective nanocoating in preventing CO2 corrosion.

5. METHODOLOGY

Steel sample coated with nanocoating will immersed in rich CO2 gas flow in control velocity.

6. POSSIBLE OBSTACLES

Mechanical damage on nanocoating because not have ability to withstand experimental velocity.

7. RELEVANCE OF STUDY

To reduce failure in industry.
To protect environment.
To improve maintenance and repair cost

8. TENTATIVE THESIS CHAPTER OUTLINE

1. Title
2. Acknowledgement
3. Appreciation
4. Abstract
5. Content
6. Case study
7. Methodology
8. Result
9. Reference
10. Appendix

9. RESEARCH PLAN/TIMETABLE

No	Description	Activities	Time
1	Experiment	Prepare experiment draft	1 month
2	Experiment	Finding experiment problem and solve	1 month
3	Experiment	Running experiment	6 months
4	Research writing	Writing	4 months
5	Conference		1 month
6	Submission	Preliminary thesis and final thesis	2 months

10. BIBLIOGRAPHY

Corrosion Protection of Stainless steel in CO2 Environment by Nanocoating of Zinc Phosphate with DLC Filler, Rajesh Kumar Singh, Sanjoy Misra

Nano Coating Application for Corrosion Reduction in Oil and Gas Transmission Pipe: A Case Study in South of Iran, E. Noveiri and S. Torfi